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Bechuanaland Protectorate Government

**Annual
Medical and Sanitary
Report**

FOR THE YEAR 1955



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Office of the Director of Medical Services, MAFEKING



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Medical and Sanitary
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BECHUANALAND PROTECTORATE

ANNUAL MEDICAL AND SANITARY REPORT
for the year 1955

SECTION I — ADMINISTRATION

1. Staff

SENIOR SERVICE

- Director of Medical Services
- 1 Medical Officer of Health
- 11 Medical Officers
- 3 Health Inspectors
- 2 Rodent Officers
- 4 Matrons
- 10 Nursing Sisters
- 1 District Nursing Sister
- 1 Housekeeper
- 2 Clerks
- 1 Storeman
- 2 Lady Clerks

JUNIOR SERVICE

- 5 Health Assistants
- 19 Dispensers
- 1 Microscopist
- 1 Senior Sanitary Inspector
- 5 Sanitary Inspectors
- 2 Pupil Sanitary Inspectors
- 15 Medical Orderlies
- 25 Staff Nurses
- 29 Probationer Nurses
- 2 Male Nurses
- 4 Male Attendants (Mental Home)
- 3 Female Attendants (Mental Home)
- 7 Cooks
- 5 Clerks
- 7 Drivers
- 7 Lorry Labourers
- 4 Kitchen Helps
- 5 Gardener/Messengers
- 6 Labourers
- 17 Launderers
- 4 Sewing Women
- 22 Housemaids

2. Dr. B. O. Wilkin, O.B.E., M.B., Ch.B., D.P.H., was appointed medical officer of health on 1st March and posted to headquarters. Before his appointment Dr. Wilkin was in the Tanganyika medical service from 1925 until 1948, and from 1949 until 1954 he served as medical officer of health to the Dar-es-Salaam municipality.

3. Dr. C. F. Hansford took overseas leave from 20th January until 1st September, during which he succeeded in obtaining the diploma in tropical medicine and hygiene of London.

4. Dr. B. T. Squires, O.B.E., was on overseas leave from 22nd March to 10th October, 1955.

5. Dr. J. Oliver proceeded on overseas leave on 5th September and was successful in the first part—the certificate—of the course leading to the diploma in public health. Dr. Oliver returned to duty early in the new year.

6. Dr. K. D. Gill was appointed medical officer on the 20th October, 1955, and posted to Lobatsi in the first instance. Thereafter he was on temporary relieving duty at Francistown and Serowe.

7. No medical officer resigned during 1955 and, for the first time for many a year, the complement of doctors reached approved strength towards the end of the year.

8. One health inspector resigned. The vacancy was not filled by the end of the year. However, a field officer with considerable experience of rural public health and sanitation was appointed on a temporary basis. He was first appointed to Maun but later transferred to Lobatsi.

9. Owing to the difficulty in staffing at the Scottish Livingstone Mission Hospital, Molepolole, which was due to the seconding of the medical superintendent to the endemic syphilis campaign in the territory, sponsored by the World Health Organisation/United Nations International Children's Emergency Fund, a Government medical officer was posted to the mission hospital which serves a fairly densely populated area. This arrangement enabled the field work in the campaign to proceed uninterruptedly and at the same time ensured the continuity of medical services in the Bakwena reserve.

10. The trained nursing staff position continued to give considerable cause for concern and recourse had to be made to the employment of locum tenens staff for prolonged periods. While this arrangement was not a satisfactory one, because of the frequent changes which resulted, it did help to alleviate the position, although at considerable expense.

11. Sister E. M. Colville resigned because of ill-health on the 29th April and Sister Francis on the 14th April.

12. Sister M. L. Crawford died on 21st February. From 1938 to 1944 she served as matron of the Kyrenia Hospital, Cyprus, and from 1944 to 1949 she was in the service of the government of St. Helena as senior nursing sister. Prior to these appointments she had served in India and Newfoundland.

13. The appointment of a district nurse to Ghanzi on 1st December has filled a long-felt want and caused considerable satisfaction. An ambulance and driver have also been posted to Ghanzi to enable the district nurse to travel round this very extensive district and also to transport patients in need of medical assistance.

14. The post of housekeeper, Lobatsi hospital, was filled on 24th January and remained so throughout the year.

Visits

15. Dr. R. Marti, chief African representative of UNICEF accompanied by Mr. S. Sutton, also of UNICEF, visited headquarters during May and also visited Lobatsi.

16. Dr. K. A. T. Martin, public health area officer of World Health Organisation also paid a visit to the territory.

17. Dr. A. J. Lewis, World Health Organisation consultant in tsetse and trypanosomiasis control and formerly of the East African Tsetse and Trypanosomiasis Research and Reclamation Organisation, visited the territory on secondment.

18. Dr. J. F. Murray of the South African Institute for Medical Research visited the territory on numerous occasions as World Health Organisation consultant to our own endemic syphilis project.

19. The Director of Medical Services met Dr. C. J. Hackett, World Health Organisation consultant in venereal diseases, in Johannesburg. The Director of Medical Services also attended the fifth session of the African regional committee of the World Health Organisation at Tananarive, Madagascar, in September.

20. Dr. F. Zumpt, senior entomologist, South African Institute for Medical Research, continued the arthropod survey begun in December, 1954. At the end of the year under review he was still occupied with this work.

21. Dr. P. H. Maury, chief of the central venereal diseases section of the French colonial government, with headquarters at Rabat, Morocco, visited the territory in December to see our endemic syphilis project and spent some time in the field.

22. Mr. J. F. Wilson, O.B.E., director of the British Empire Society for the Blind, visited the territory in November. After discussions at Mafeking a meeting was held at Lobatsi at which the divisional commissioner, welfare officer and various chiefs and headmen from different parts of the territory were present.

Legislation

23. Proclamation 102—The Bechuanaland Protectorate Nursing Sisters (Retiring Allowances) Proclamation (Chapter 48 of the Laws of the Bechuanaland Protectorate.

24. Government Notice No. 49 of 1955 cancelled the yellow fever regulations contained in Government Notice No. 24 of 1954.

25. High Commissioner's Notice No. 156 of 1955—The Export Control Regulations defined certain medical requisites in Schedule B which were controlled.

SECTION II — PUBLIC HEALTH

Staff

26. The previously vacant post of medical officer of health was filled on 1st March. This officer was based on medical headquarters, Mafeking. Two health inspectors were employed, one based at Lobatsi and the other at Francistown. The third post remained vacant throughout the year. The Lobatsi officer went on leave in September pending resignation. Two rodent inspectors were employed on plague control measures. They were based on Maun.

27. The medical officer of health toured the north-west and eastern stations, making several visits on routine work. Special surveys were made of the malaria situation at Serowe and along the Molopo river border of the

Protectorate. All hotels were inspected and each station was visited on several occasions. Detailed reports on the hotels were submitted to Licensing Courts sitting to renew hotel and liquor licences. The health inspectors visited most stations at least once monthly. The total mileage travelled by senior service health staff amounted to nearly 30,000 miles.

Climate

28. Public health in the Bechuanaland Protectorate is perhaps more influenced than is the case elsewhere in southern Africa by its climate. In a central continental position, screened from the prevailing south-easterly trade winds by higher ground in the Union of South Africa, the Protectorate lies in two hollows north and south of the Tropic of Capricorn. The Zambesi and Limpopo rivers drain the surrounding heights to the Indian Ocean from the north, and from the south east, while the Orange River takes tributaries from the heights of South West Africa to the Atlantic, leaving the territory without running streams, except along its eastern boundary. One major exception is the great Okovango River which runs from Angola to the Zambesi to create the vast Okovango and Makarikari swamps in the northern desert hollow of the territory. 275,000 square miles in extent, the Bechuanaland Protectorate includes moist and dry sub-tropical areas in the north and dry semi-desert in the centre and south, the whole area showing an average annual rainfall of 18 inches. The population clusters where water can be obtained.

29. Human disease patterns are conditioned by these factors as are the habits and occupations of the indigenous people. In the dry areas the people are stockmen, their range being limited by watering facilities. Agriculture fringes the eastern side. The Okovango and Makarikari swamps support hunters, fishermen, cattle and crops in an area containing much game, but infested with tsetse fly.

Bilharziasis

30. Sixty-five cases were diagnosed of which eight were sufficiently severe to warrant hospital treatment. The distribution was as follows:—

TABLE I				
Gaberones	...	...	...	4
Lobatsi	...	...	...	7
Mahalapye	...	...	...	2
Maun	...	...	...	24
Mochudi	...	...	...	21
Molepolole	...	...	...	2
Serowe	...	...	...	5
Total				65

31. Bilharzia is not a universally distributed disease in this territory where dessication is the rule and surface standing waters are scarce. The habitat of the snail host is very limited except in the northern part of the Protectorate. Intensive and costly well-drilling and surface conservation has been in progress for some time and is to be increased in intensity during the next five years at great cost. Provision is accordingly being made to map accurately the snail host habitats and to take whatever steps are necessary to ensure that water development plans do not result in increased risk of spreading the infestation. Medical and health staff are being stimulated to collect and despatch snails for identification. W.H.O. have appointed a bilharzia consultant who is shortly to visit the territory and report.

Diphtheria

32. Ninety-one cases with 12 deaths were reported as compared with 132 cases and 16 deaths during the previous year. The majority of cases emanated from the Serowe, Francistown, Lobatsi and Mahalapye districts, the distribution being as follows:—

TABLE II

<i>District</i>	<i>Cases</i>	<i>Deaths</i>
Francistown...	20	6
Gaberones ...	2	—
Lobatsi ...	12	1
Mahalapye ...	11	—
Mochudi ...	5	1
Molepolole ...	2	—
Serowe ...	39	4
	—	—
Total ...	<u>91</u>	<u>12</u>

33. Until ten years ago neither diphtheria nor whooping cough was of much consequence here. Cases of diphtheria were of a sporadic nature and though whooping cough was more prevalent than was diphtheria, the incidence was not unduly high. At all times free immunisation against diphtheria has been provided on a small scale, particularly in communities at risk but, because of lack of funds and staff, it has not been possible to extend this into a mass campaign. The size and nature of the Protectorate and the stage of development of its people preclude the likelihood of mass immunisation being effected through existing medical centres. It has now been decided to carry out a mass immunisation campaign against diphtheria and whooping cough during 1956/57 by means of special teams of trained workers moving throughout the territory. Since 1950 the reported incidence of each disease has been as follows:—

TABLE III

<i>Year</i>	<i>Diphtheria</i>	<i>Whooping Cough</i>
1950 ...	154	1,531
1951 ...	265	369
1952 ...	112	1,210
1953 ...	166	1,006
1954 ...	132	1,302
1955 ...	91	1,499

The above figures do not reflect the true incidence (which is much higher) but only those cases coming to the knowledge of medical staff.

34. UNICEF has now agreed to support a mass immunisation campaign against these two diseases. The scheme has the technical approval of W.H.O. and is due to start on 1st May, 1956. It is expected to last two years. The objective is the inoculation, with combined whooping cough and diphtheria vaccine, of all children up to the age of six years and with diphtheria vaccine alone, of all children from six to eighteen years of age. The aim is to reach at least 80 per cent of the susceptible population. Thereafter, methods and procedures will be established for the regular and continuing long-term immunisation of all young and school-age children in the territory. It is anticipated that there are 50,000 children up to six years of age and 70,000 children between six and eighteen years of age, of which 26,000 attend school and 44,000 do not.

35. The vaccine to be used is the combined whooping-cough vaccine and formol-toxoid for children under six years of age and PTAP for those between six and eighteen years. Children under six will receive three injections of

0.5 c.c. at approximately monthly intervals. The aim will also be to give each child in the age range six to twelve years two injections of PTAP (15 Lf per 0.5 ml) at approximate monthly intervals and each adolescent of twelve to eighteen years two injections at one month intervals of PTAP (5 Lf per 0.5 ml). The product made by the South African Institute for Medical Research will be used.

36. The Government will also provide funds for this campaign and in addition an application for further financial support from Colonial Development and Welfare funds has been submitted.

Dysentery

37. One thousand, two hundred and sixty cases were notified of which 572 were bacillary, 63 amoebic and the rest unspecified. A relatively large number of government officers became ill with amoebiasis of which acute manifestations were seldom encountered. In most instances the infection was of a chronic intermittent character with considerable undermining of the general health. Admission to hospital and a period of sick leave of usually one month were required in most instances. As this disease is so widespread the actual source of infection could seldom be elicited.

Leprosy

38. Thirty-four cases were recorded of whom 31 were long-standing cases seen in N'gamiland, two were reported from Francistown and one from the Serowe district. The Leper Institute at Botsabelo in Basutoland continued to receive the few active cases encountered as no special provision exists in this territory. This disease is fortunately not a problem in the Bechuanaland Protectorate.

Malaria

39. Two thousand, one hundred and nine cases were reported during the year. The distribution is given in Table IV.

TABLE IV

<i>District</i>				<i>Cases</i>
Francistown	...	...	...	325
Gaberones	...	...	...	22
Kanye	...	...	...	120
Lobatsi	...	...	...	15
Mahalapye	...	...	...	36
Mochudi	...	...	...	26
Molepolole	...	...	...	497
N'gamiland	...	...	...	861
Serowe	...	...	...	207
Total	...	...	...	2,109

Two deaths were reported.

40. Malaria prevails in limited areas. N'gamiland and Francistown, together with villages along the Botletle stream and the Makarikari swamp, also the Chobe river section, reported cases throughout the year, whereas further south, as at Molepolole and Kanye, outbreaks are more seasonal. This disease is difficult to control because the agricultural section of the population lives mainly in large groups of villages for part of the year and moves to agricultural holdings for the planting and reaping seasons during other months. In the course of their agricultural activities they are more liable to be exposed to malaria and are too scattered to make adequate use of hospital and dispensary facilities.

41. On both sides of the Crocodile River the interterritorial agreement with the Union of South Africa for the control of malaria remained in force. An exchange of information regarding the situation on both sides of the Molopo River was maintained.

42. The Molopo River and all its tributaries arise in the Union and no branches of it penetrate the waterless, almost deserted areas of this territory along the river's northern banks. The river and its tributaries are dry over large stretches for most of the year but ponding occurs to a small extent in several places along the main stream above Bray. The Protectorate side of the border is mainly devoid of water and supports life only where boreholes and wells have been sunk for the cattle and people living thinly at widely scattered points along the half-mile deep stretch of land along the northern bank.

43. In April, following reports of an "outbreak" of malaria along the Molopo, a survey of the area was organised from the eastern end of the Colonial Development Corporation ranches to 27 miles beyond Werda. A large number of blood slides were taken from people on the Bechuanaland Protectorate side of the border and the South African Institute for Medical Research reported less than one per cent as positive for malaria. This was accompanied by a zero spleen index. At Werda no anopheles was found in 100 huts treated. The reed-grown and ponded river was found to contain a few anopheles larvae at some points.

44. Following the survey, all huts on the Bechuanaland Protectorate side of the river were sprayed with residual insecticide at the end of April. (The Colonial Development Corporation ranch staff regularly spray all houses and huts.) The spraying of huts and houses covering an area half-a-mile broad on the Protectorate side of the river was repeated in September.

45. An arrangement which has been in force for a considerable period also exists whereby Union health personnel are permitted to move across the border into this territory in the course of their investigations and work. Excellent liaison between the two territories was maintained.

46. The ever-increasing reports of the development of resistance by insects to insecticides is receiving attention here as elsewhere. It has been observed that, in the Bechuanaland Protectorate, African huts possessing a broad space between the wall and the roof thatch yield very few anopheles resting during the day on walls therein. This may be due to the surviving insects having become wary of resting during the day-time in huts. At dawn, or even immediately after taking a blood meal, they fly to adjacent cover outside the huts. Others appear to hide in the interstices of the thatch high in the roof peak where wind is screened and little movement takes place. More observations on the resting habits of anopheles are being arranged.

Plague

47. No case of plague was reported during the year. Routine surveys were continued and all huts in the areas at risk were dusted with insecticide on two occasions. Over 10,000 miles were journeyed by the plague control staff and more than 15 tons of residual insecticide powder were expended.

48. A plague inspector from the Union health department was seconded to conduct a survey which yielded much useful information. Active liaison with the Union health department and its plague research laboratory was maintained.

49. In the village of Gomare floor sweepings from 35 huts revealed only chicken fleas. No evidence of rodent infestation was found except in one hut where a *Thallomys* nest was revealed in the ridge of the roof of the hut. The

mother and four babies were captured and 80 fleas were collected from the body of the adult. There was no evidence of recently heavy rodent or flea infestation.

50. At Tokoboyo's village, about half-way between the main village and the river, 180 fleas were collected in one hut in an area of about two square yards. This was the only village on the entire survey where a moderate *Mastomys* infestation was found. Twenty-two traps set in the huts and in the thorn bush hedge around the village yielded five *Mastomys* and three *Tatera schinzi*. Evidence of very wide scattered gerbil infestation was found in the sandy soil around the village and on the sand belt towards the river. No regular gerbil warrens were found and no evidence of past mortality was unearthed.

51. On Tubu Island, the scene of a severe outbreak of pneumonic plague in 1951, only two rodent fleas were found in the sweepings of 28 huts from which samples were taken. No evidence of past or present gerbil infestation was found on the island. Springhare burrows were active.

52. Between Nokanen and Tsau on the river road, findings similar to those already described were made. At Tsau very scattered *Tatera* burrows were found. Only chicken fleas were seen in those huts which were sampled. Rodent infestation of the huts were absent. Scattered active *Tatera* burrows were found under bushes and under small trees but no evidence of mortality was discovered.

53. At Sehitwa on Lake N'gami, where widespread infestation was found during the plague outbreak of 1946, no evidence of gerbil warrens was seen nor was a single rodent caught in the 80 traps set during the night. No fleas were found in the hut sweepings. No rodent infestation was found in the huts.

54. At Toten light *Tatera* infestation was found under trees and bush. No regular *Tatera* warrens were found over a wide area searched which had a heavy infestation during 1944-45 and 1946. There was no evidence of recent mortality in this area. Only chicken fleas were found in the huts.

55. This survey of N'gamiland revealed rodent infestation to be low. Although *Mastomys* is known to breed up very rapidly it is considered unlikely that a heavy increase in the rodent population will occur in this area for at least two or three years.

56. Ample evidence was obtained of the excellent results achieved in minimising the flea population in the huts by the regular and routine use of 10% D.D.T. in talc. The African population clamour for the dusting of their huts but it is anticipated that still better results will follow the use of a mixture of 10% D.D.T. in talc with 1% gamma B.H.C. in eradicating the tampan (*Ornithodoros moubata*) the transmitter of relapsing fever and the chicken flea (*Echidnophaga gallinacea*). There is now ample evidence that *Echidnophaga* are capable of transmitting plague, a fact which makes its eradication from huts all the more necessary. The use of the D.D.T.-B.H.C. mixture was introduced as a routine measure and the number of routine dustings was reduced from two to one annually. This reduction in the number of dustings will take place only as long as the situation remains satisfactory.

57. It is, of course, necessary to bear in mind that the co-operation of the local population, which is engendered by frequent routine applications of insecticides in their huts, is of great value in an outbreak of plague. A twice-yearly routine dusting tends to keep the population "flea conscious" as well as reducing the blood-sucking insects which infest their huts. This routine

also provides more frequent information of the situation as the dusting is accompanied by the collection of fleas and rodent specimens for identification and records.

58. It has, however, been decided to reduce the number of dustings to once annually for a trial period in the following areas subject to flea counts remaining satisfactory:—

- (a) Seronga and Mohembo
- (b) Chobe District
- (c) Gweta area
- (d) Pandamatenka
- (e) Rakops - Lothlakane
- (f) Kalahari Desert area

This dusting will, as far as possible, be carried out during the humid months after the rains, whenever road conditions render that period possible for motor transport.

59. It is now proposed to post one rodent officer to the Southern Protectorate.

Rift Valley Fever

60. In 1951 the attention of staff was drawn to the existence of this disease in neighbouring territories where it was giving some cause for concern. Transmitted by mosquitoes, it is mainly a veterinary disease affecting sheep, goats and cattle, but human infection occurs and has been believed to be mainly amongst veterinarians, farmers who attend their own flocks and herds, butchers and housewives who handle infected meat. The milk from dairy cows also contains large quantities of the virus.

61. No reports of clinically or serologically established Rift Valley fever have been received from medical staff despite the likelihood of the disease entering the Protectorate from neighbouring territories where it has been rife at different times. We were also informed that the Protectorate veterinary authorities have not established the presence of this disease here.

62. During recent mouse-protection tests for yellow fever immunity carried out on human sera from the N'gamiland and Chobe areas, mouse-protection tests for the presence of Rift Valley fever immunity were also performed. These tests revealed that the disease has certainly been present amongst the human population and showed the following results:—

<i>Place</i>	<i>Total</i>	<i>Positive</i>	<i>Negative</i>	<i>Inconclusive</i>	<i>% Positive</i>
Katchikau	34	6	25	3	17.6
Kasane	15	1	13	1	6.6
Maun	20	2	18	—	10.0

63. The veterinary department is now pursuing this investigation from their own point of view. From the human epidemiological and public health point of view, however, the findings are not really important other than to establish the presence of the disease in the Bechuanaland Protectorate as the human variety is usually mild and influenzal in nature with sequelae infrequent.

Rabies

64. No confirmed case of human rabies was reported. One hundred and eighty-four prophylactic anti-rabies inoculations were given to persons suspected to be at risk.

65. During February an outbreak of canine rabies occurred in the Serowe district in the course of which two dogs died, four were destroyed and 33 dogs immunised. In Francistown one dog was destroyed.

66. During March, 18 outbreaks of the same disease occurred at Francistown: 16 dogs were destroyed and 27 were immunised.

67. During April, six outbreaks of clinical rabies amongst the canine population, none of which were, however, confirmed, were reported from the Serowe district.

68. Canine rabies was again reported in June, this time in the Palapye and Maun areas, where 241 and 62 dogs respectively were immunised.

69. In September, this disease was again diagnosed in a dog at Palapye and, on this occasion, the diagnosis was confirmed biologically and histologically. A general tie-up order was imposed by the veterinary department and the inoculation of dogs in the area was undertaken.

Respiratory Diseases

70. The number of cases approximated the number seen the previous year. Of a total of 14,268 (14,627 in 1954) upper respiratory infections, 2,030 were diagnosed as pneumonia, of which 902 were lobar, 802 bronchopneumonia and 327 primary atypical and other unspecified forms. The mortality rate of all forms continued to be low and was only 1.1 % for those treated in hospital.

Malnutrition and Deficiency States

71. The total number of cases reported was 2,328 as compared with 3,177 during 1954. Of this number 53 were diagnosed as beri-beri, 579 as pellagra in all forms, 382 as scurvy and the remainder as "other deficiency states".

72. As indicated in previous reports, kwashiorkor has not been reported from this territory despite a very special and careful look-out.

73. The total number of deficiency states remained at approximately 2 % of the total number of first attendances, the same figure as in the previous year.

Smallpox

74. This territory fortunately escaped the severe outbreaks experienced by a number of neighbouring territories, particularly to the north. For the first time for many years not a single case was reported throughout the Protectorate.

75. When news of the widespread incidence from other areas was received, an extensive anti-smallpox vaccination campaign was immediately organised as a precautionary measure. In addition, mine recruits continued to be vaccinated on attestation.

76. The attitude of the African population to vaccination against smallpox appears to have changed favourably since the outbreak in 1950.

Trypanosomiasis

77. Four new cases were admitted to Maun hospital during the year under review.

78. The first, admitted in May, contracted the disease in the Nokanen area. A girl of 14 years, she suffered severe symptoms on admission but improved greatly after treatment. She returned to hospital in December, however, with a recurrence of symptoms and at the end of the year remained under treatment.

79. The second case, also admitted in May, was employed by tsetse fly control. It was not possible to discover exactly when or where he became infected as he suffered no symptoms, the diagnosis being established on routine blood examination. After treatment he returned to duty but remained under observation.

80. The third case was a European sub-inspector of police who also became infected in the Tsau-Nokanen area. He, too, complained of no symptoms but was diagnosed on routine examination. After treatment he returned to duty and is also being kept under observation.

81. The fourth case was admitted to hospital in November. He was a male adult who apparently acquired the infection while on a journey up the Boro River. He suffered mild symptoms and is presently under treatment.

82. Prophylactic pentamidine isethionate continued to be used on personnel working on tsetse fly control but the interval between injections was increased to six months. The whole matter of treatment, both curative and prophylactic, is now under review.

83. A guinea pig, inoculated with trypanosomes taken from the fourth case mentioned above, was sent to London at the request of the London School of Hygiene and Tropical Medicine. This animal arrived safely with a good infection and the strain is now being used in the department of protozoology of the school.

84. Dr. E. A. Lewis, W.H.O. consultant in trypanosomiasis and tsetse fly control, visited the territory during the period 1st June to 13th July. After discussions with medical and veterinary administrative officers at Mafeking, Dr. Lewis spent more than three weeks in the tsetse fly control area with the tsetse fly control officer. A draft plan of operations was drawn up and submitted to W.H.O.

85. Efforts were made to obtain assistance in preparing a vegetation map from aerial photographs for the purpose of planning discriminative clearing and costing, as an anti-tsetse operation, and to enable the current scheme to be put into effect immediately.

86. A Colonial Development and Welfare scheme for tsetse fly control to cost £56,335 was approved.

87. At the time of writing, Dr. Lewis' report of his visit and recommendations had not been received.

Tuberculosis

88. This disease constitutes the main medical problem of the territory. Two thousand and seventy-nine cases sought treatment during the year, of which the pulmonary form constituted 1,466; tuberculosis of the meninges and central nervous system 29; intestinal, peritoneal and glandular forms 85; bones and joints 122, and other forms 377.

89. The distribution was as follows:—

TABLE V

<i>District</i>				<i>Cases</i>
Francistown	...	...	...	214
Gaberones	...	...	...	36
Kanye	...	...	...	317
Khale	...	...	...	76
Lobatsi	...	...	...	265
Mafeking	...	...	...	28
Mahalapye	...	...	...	96
Maun	...	...	...	73
Mochudi	...	...	...	34
Molepolole	...	...	...	278
Ramoutsa	...	...	...	356
Serowe	...	...	...	306
Total	...	...	...	<u>2,079</u>

90. All tuberculostatic drugs are now provided free to medical missionaries.

91. A start was made with the construction of a new tuberculosis block of 20 beds at the Francistown hospital. Plans were also drawn up for the provision of more beds for isolating cases of infectious tuberculosis at many other centres.

92. The report of Dr. D. R. Thomson, tuberculosis consultant to W.H.O. who visited the territory in January, 1954, became available during the year. This report stressed the urgency of the problem of tuberculosis in the Protectorate and the need for further pilot studies.

93. As a result, representations were made during the fourth W.H.O. regional committee meeting for the W.H.O. tuberculosis assessment team to visit this territory about the middle of 1956. This was agreed to. The team's findings would be collated with those obtained during the 1952 survey when tuberculin testing and a mass x-ray survey was initiated.

94. W.H.O. have made tentative financial provision in its budget to assist the territory.

Venereal Diseases and Treponematoses

95. Of 13,499 cases of all forms seeking treatment, 13,456 were accounted for by the treponematoses and gonorrhoea. Forty-one cases of lymphogranuloma venereum and two cases of granuloma inguinale were reported.

96. In the 1954 report a brief reference was made to the W.H.O./UNICEF-assisted project into the investigation and treatment of the treponematoses. The objectives were to make a thorough study of the non-venereal treponematoses known locally as "dichuchwa" and to permit indirectly the collection of other health data; to train local professional and auxiliary personnel in the epidemiology, diagnosis and modern therapy of the disease; to encourage active case finding and treatment by existing medical centres to the extent that there would be developed, following a preliminary study of about one year, a mass treatment campaign covering the whole Protectorate; the results of the campaign to be followed up and consolidated by existing local health and medical personnel and facilities.

97. The phase of investigations is now mainly over. The results have been analysed and incorporated in a report which has been submitted to W.H.O. Publication of this report is expected shortly.

98. Essentially this disease is a childhood and family disease, usually spread non-venereally although venereal spread may occur. It affects mainly the more primitive and unhygienic members of the tribe amongst whom it spreads through the use of communal domestic utensils and through direct contact. The early lesions are similar to the secondary lesions of sporadic venereal syphilis, and these lesions are followed in a number of cases by tertiary lesions. The tertiary lesions affect mainly the skin, causing gummatous ulceration; the nasopharynx and the long bones. Primary lesions are rare but do occur, as for example on the nipples of the mother following the feeding of an infected infant.

99. The highest infection rate was found amongst the Bakgalagadi people living in the Kalahari desert. It is here that the mass treatment campaign will receive special emphasis. Treatment with PAM has been found to be very effective, and there is no doubt that the mass treatment of cases and contacts, combined with improved standards of hygiene, can eradicate the disease.

100. Treponemes were successfully isolated from two typical cases of dichuchwa by the subcutaneous inoculation of hamsters. The animals were transferred by air to the International Treponematoses Laboratory at Johns Hopkins Hospital, Baltimore, where the strains were studied by Professor T. B. Turner and Professor D. M. Hollander. In a personal communication Professor Turner states that the strains were compared morphologically and by cross immunity experiments in rabbits and hamsters with the "standard" Nichols strain, with yaws strains and with strains from cases of endemic syphilis in Bosnia, and cases of bejal in Syria and Iraq. As a result of the animal experiments it appears that the "Bechuanaland strains do not belong unequivocally within either the syphilis group of strains or the yaws group. They partake of characteristics of both, and in that respect resemble other strains of treponemes isolated from cases of non-venereally transmitted treponematoses, including bejel and endemic syphilis". It is expected that the results of these investigations will be published from the International Treponematoses Laboratory in greater detail in due course.

101. Following the phase of investigation, the mass treatment campaign was begun. It started well and by the end of the year under review 124,079 persons had been seen and treated, either curatively or as contacts.

Yellow Fever

102. Mouse protection tests were continued on samples of blood from African school-children at Francistown. This is being done annually amongst the same children to determine whether any immunity against yellow fever is developing in the permanent population here. The whole of the territory is considered a receptive area.

103. During the year, Government Notice No. 24 of 1954, which imposed yellow fever control on aircraft landing in certain areas, was withdrawn by Government Notice No. 49 of 1955.

Miscellaneous Infectious and Contagious Diseases

104. The recorded incidence of these disorders is given in Table VI.

TABLE VI

<i>Diseases</i>	<i>Cases</i>
Measles	952
Meningococcal Infections	21
Pertussis	1,499
Scarlet Fever	7
Typhoid and Paratyphoid Fever	13
Varicella	182

It is of interest to note that no cases of poliomyelitis was reported during the year.

Intestinal and Urinary Parasites

105. While the dysenteries do occur, the enteric fevers are remarkably absent from the prominent position they might be expected to occupy in the hospital statistics of a group of communities amongst which the construction and use of a domestic latrine is practically unknown. The annual nosological returns from all stations show about 500 cases of dysentery (amoebic, bacillary and unspecified), 332 cases of ascariasis, only 421 tape-worm infestations and 135 "other helminths".

106. Sixty-five cases of *S. haematobium* infestation were recorded, but this is not considered a true reflection of the actual incidence. Several surveys in the Bakgatla reserve alone have placed the infestation rate at between 30%

and 60% of the child population of those persons living along the Notwani and Marico rivers, especially those near Mochudi. Clinical records indicate, however, that bilharzia is not common throughout the rest of the territory. It is hoped shortly to conduct further surveys to assess the true picture.

107. In the face of these low figures for human intestinal parasites, the high rate of cysticercosis in cattle is difficult to account for unless one accepts the theory that only the minority of human hosts seek treatment. During March, 1955, discussing item 7 of the 57th session of the European Advisory Council, the serious loss of meat and of money, which the discovery of measles in carcasses caused to cattle producers here, was vigorously stressed. At that session the director of medical services outlined accepted preventive procedures which can be employed to check the passage from man to beast, including amongst others, the use of separate latrine places for labourers, so arranged that cattle could not gain access nor flooding disperse the fresh faeces. The medical department subsequently communicated with a wide range of authorities until satisfactory pamphlets and posters were found, translated and distributed.

108. During the year under review, 67,084 cattle were slaughtered at the Colonial Development Corporation abattoir at Lobatsi. Of this number 419 whole carcasses were condemned because of measles and a further 2,609 detained, making a total of 3,028 carcasses showing measles infestation or 4.5% of the total carcasses passing through the abattoir.

109. Other causes of condemnation of whole carcasses were:—

<i>Cause</i>	<i>Number of carcasses condemned</i>	<i>% of total</i>
Pyogenic Processes	218	0.32
Inflammatory Processes	233	0.35
Degenerative Processes	242	0.36
Neoplasms	14	0.02
Non-infectious Conditions	26	0.04
Parasitic Conditions	16	0.02
Protozoal Infections	1	0.0014
Contamination and Bruising	196	0.29
Specific Infections	4	0.006

Other condemnations of a partial degree were also made.

110. This abattoir came into full production and at peak periods over 400 oxen per day were slaughtered. This placed a tremendous strain on the effluent disposal plant which was unable to cope. The resulting ponding in the Lobatsi river bed of this foul and fly-breeding discharge gave this department considerable cause for concern. Steps were taken to rectify the position and remove the grave danger to the public health.

111. There are two government-maintained local abattoirs at Lobatsi and Francistown. The Lobatsi unit is now too small and totally unsatisfactory for its increased duty. Financial provision for the creation of a new abattoir is expected to be made in the 1956/57 financial year, from which time all government controlled abattoirs will pass from medical to veterinary control.

112. At the villages of Maun, Serowe, Palapye, Mahalapye and Kanye the African health staff trained to do this work endeavoured to maintain a reasonable routine of meat inspection within the limits of their other duties. Adequate supervision from the senior health staff was ensured. This will be continued until the veterinary department are sufficiently staffed to take over these duties.

Housing and Town Planning

113. Housing and town planning targets differ according to three basic ownership considerations:—

- (i) In African reserves where all land is vested in the chief for tribal use, there is no sale of land nor is a lease given to any owner;
- (ii) In the Tati concession the company is the landlord and has power to sell or to grant leases on land and property within its concession area;
- (iii) On Crown lands government leases can be granted.

114. Tribal customs remain too strong for village planning on lines followed in some other African territories. A tribesman simply builds his compound where allocated by the African authority, i.e. the chief or the headman. In these areas non-native traders may be granted a piece of land on which to erect a store subject to a licence being forthcoming. But the lessee holds no lien over the materials used to erect the store or over the ground and he receives no lease. Hence, he has no security of tenure.

115. These considerations limit town planning and building control in African reserves very considerably. Nevertheless, it was our experience that traders always accepted advice offered by the department in maintaining public health standards when erecting new properties.

116. At government centres within African reserves and on Crown lands, progressive village planning is in force. Plans for individual houses and layout plans are always discussed by the medical and public works departments before being approved. Official quarters are constructed of permanent materials of a satisfactory nature and compare favourably with accepted modern living standards.

117. The following new prefabricated houses for senior service officers were erected during the year:—

Francistown	...	...	4	Makoba	...	...	...	1
Gaberones	...	...	6	Maun	...	...	...	4
Lobatsi	...	...	3	Molepolole	...	...	...	1
Mafeking	...	...	6	Serowe	...	...	...	1
Mahalapye	...	...	3					

Water-borne sanitation was provided. Six houses for African police were also completed.

118. A new wing for 20 tuberculosis patients at Francistown hospital was begun.

119. A new health centre was begun at Gaberones, estimated to cost £5,500.

SECTION III — VITAL STATISTICS

120. The collection of vital statistics is handicapped by lack of compulsory notifications. The only near reliable sources of information are hospital and dispensary records.

121. The last available census figures of 1946 are given below:—

TABLE VII			
Europeans	...	...	2,379
Africans	...	...	292,755
Asiatics	...	...	94
Coloured	...	...	1,082
Total population			<u>296,310</u>

This total corresponds with a population density of just over one person per square mile.

122. The next census is due to take place during 1956 and on this occasion a sample census is proposed.

European Birth Rate and Death Rate

123. **TABLE VIII**

Total European Births	...	...	...	...	71
Births per 1,000	...	...	...	...	30
Total European deaths over 1 year of age	...	...	...	...	10
Deaths per 1,000	...	...	...	...	4.2
Deaths under 1 year of age	...	...	...	...	1

TABLE IX

Causes of European Deaths

Coronary Thrombosis	...	1
Drowning (accidental)	...	1
Carcinoma of the Lung	...	1
Cachexia	...	1
Strychnine Poisoning	...	1
Heart Failure	...	1
Enteritis	...	1
Asthma	...	1
Convulsions	...	1
Peritonitis	...	1
Unknown	...	1

Illness of Officials

124. Causes of morbidity amongst senior service and junior service government officials who were off duty for more than 14 days are given in Tables X and XI. There are 397 European and 1,260 African officials employed in government service.

TABLE X
Senior Service

Amoebiasis	...	...	...	...	4
Appendicitis	...	...	...	...	2
Bilharziasis	...	...	...	...	1
Bronchopneumonia	...	...	...	...	1
Chicken Pox	...	...	...	...	1
Haemorrhoids	...	...	...	...	2
Injury	...	...	...	...	1
Ovarian Cyst	...	...	...	...	1
Paroxysmal Tachycardia	...	...	...	...	1
Pleurisy	...	...	...	...	1
Removal of cartilage of knee	...	...	...	...	1
Salivary calculus	...	...	...	...	1
Septicaemia	...	...	...	...	1
Syncope	...	...	...	...	1
Tonsillectomy	...	...	...	...	2
Urticaria	...	...	...	...	1
Total	...	...	...	...	22

TABLE XI
Junior Service

Abscess	...	...	...	...	...	1
Appendicitis...	...	...	...	...	...	3
Arthralgia	...	...	...	...	...	1
Asthma	...	...	...	...	...	1
Bronchitis	...	...	...	...	...	3
Cardiac Failure	...	...	...	...	...	3
Chronic Eye Infection	...	...	...	...	...	1
Cataracts	...	...	...	...	...	1
Cellulitis of Leg	...	...	...	...	...	1
Chronic Ulcer	...	...	...	...	...	2
Dysentery	...	...	...	...	...	2
Febricula	...	...	...	...	...	1
Fits	...	...	...	...	...	1
Fracture of Scaphoid	...	...	...	...	...	1
Hernia	...	...	...	...	...	1
Hydronephrosis	...	...	...	...	...	1
Hypertension	...	...	...	...	...	2
Infection of Foot	...	...	...	...	...	1
Influenza	...	...	...	...	...	1
Injury	...	...	...	...	...	3
Ischio-Rctal Fistula	...	...	...	...	...	1
Malaria	...	...	...	...	...	5
Mental Aberration	...	...	...	...	...	2
Neuritis	...	...	...	...	...	1
Pleurisy	...	...	...	...	...	1
Pneumonia	...	...	...	...	...	7
Pyelitis	...	...	...	...	...	1
Pyorrhoea	...	...	...	...	...	1
Sciatica	...	...	...	...	...	1
Syphilis	...	...	...	...	...	1
Tenosynovitis	...	...	...	...	...	1
Tuberculosis...	...	...	...	...	...	5
Total						58

There was one European and two African deaths.

SECTION IV — MATERNITY AND CHILD WELFARE

125. There were 1,775 normal confinements in hospitals and a further 251 admissions took place on account of various complications, not including abortions and miscarriages. Two thousand, two hundred and ninety-four infants were born alive.

126. One hundred and forty-six cases of abortion or miscarriage were treated in hospitals of which 26 were complicated.

127. Ante-natal attendances numbered 13,952 and there were a further 631 post-natal attendances. Attendances at post-natal clinics are not large because tribal law and custom ordain a long period of comparative isolation for the mother in the post-puerperal period.

SECTION V — GENERAL

Native Labour Recruitment

128. Fifty-eight thousand, two hundred and thirty-four recruits and repatriates passed through the various depots in the territory. Of this number 40,510 were transported from and to Shakawe, Lilongwe (Nyasaland) and Barotseland. The majority of labourers continued to avail themselves of air transport, no less than 39,358 of the 40,510 doing so. One million, four hundred and twenty-nine thousand, eight hundred and eighty-four air miles were flown by the Witwatersrand Native Labour Association's aircraft without a single mishap.

129. The following table reflects the work done at other mine recruiting centres.—

TABLE XII

<i>Station</i>	<i>Number of recruits examined</i>	<i>Number of Rejects</i>
Gaberones	1,818	69
Kanye	1,751	36
Lobatsi	2,940	77
Mahalapye	1,432	79
Maun	645	29
Mochudi	345	3
Molepolole	2,838	177
Ramathlabama	481	9
Serowe and Palapye	3,413	128
Shakawe	2,887	62
Total	<u>18,550</u>	<u>669</u>

130. The number rejected constituted 3.6 % of the total number examined and was mainly because of poor physique, under-age and varying chest conditions.

131. The development of the W.N.L.A.'s depot at Francistown, particularly as the result of centralising the aircraft there, has led to a very marked increase in the white population at that centre.

Prisons and Asylums

132. No epidemics were recorded and on the whole the health of the prisoners remained good. At Mahalapye one prisoner was found to be suffering from tuberculous peritonitis and another from malignant hypertension.

133. From the Lobatsi gaol 19 prisoners were admitted to hospital during the year, the proportion of the daily average number of prisoners in hospital to the daily average prison population was 1 %. Most of the illnesses were not of a serious nature and no deaths occurred.

134. At Serowe 493 prisoners reported sick, mainly for minor complaints. Six prisoners from Serowe and Palapye required detention in hospital. No deaths occurred.

135. At Gaberones the average daily prisoner population was 56. Gaol inmates are weighed monthly and any loss of weight investigated. Practically all prisoners gain weight. Eight required admission to Lobatsi hospital and one died of peritonitis.

136. There was no increase in prison accommodation during the year. Lobatsi remains the only prison where water-borne sanitation is provided.

137. Regular weekly gaol inspections are held wherever a government medical officer or medical missionary is available. At these inspections all complaints are investigated and a sick parade held. Prisoners may also report for medical attention at all other times. At Maun the medical officer holds a sick parade at the gaol every morning owing to the distance of the gaol from the hospital.

Mental Diseases

138. The Lobatsi mental home, with accommodation for 24 patients, was fully occupied throughout the year. There were eight admissions, two transfers to Southern Rhodesia and one death. The number of patients who required temporary detention in prisons while awaiting admission to the mental home or transfer to Southern Rhodesia was, however, small.

139. The general health of the inmates remained good and derived benefit from the open-air life afforded by the provision of adequate outdoor facilities, mainly gardening.

140. The Protectorate is again indebted to the Central African Federation authorities for continuing to accept mental patients, mainly acute cases or patients likely to benefit from modern institutional treatment not available here. Five patients were admitted to Ingutsheni Hospital, Southern Rhodesia, during 1955.

Blindness

141. The visit in November of Mr. J. F. Wilson, O.B.E., Director of the British Empire Society for the Blind, was valuable and interesting. At a meeting at Lobatsi in the southern Protectorate, Mr. Wilson was able to meet various chiefs and headmen and the divisional commissioner. The director of medical services has, for some time, acted as correspondent with the Society on behalf of the three High Commission Territories.

142. The 1946 territorial census enumerated 1,881 totally blind Africans in a general population of 296,000, a blindness rate of 636 per 100,000. The rate per 100,000 differs strikingly from district to district, e.g. Ngwato 1,070; Bakgatla 950; Gaberones 860, by comparison with Lobatsi 170; Ghanzi 180; Ngwaketsi 190. The census enumerated in addition, 2,174 Africans blind in one eye only, an incidence of 734 per 100,000.

143. A sample census in the Bamalete reserve conducted in July, 1955, for demonstration purposes in anticipation of the proposed census of 1956, recorded 87 persons totally blind in a population of 13,991, an incidence of 622 per 100,000. In addition there were 122 persons (870 per 100,000) blind in one eye only. An effort will be made in the 1956 census to obtain reliable figures of total blindness. The statistics will be sub-divided by sex and into the age groups 0-15 years, 15-40 years and 40 years and over.

144. The meeting at Lobatsi unanimously decided to seek government support for a training scheme for the blind. The object would be to equip the blind to participate in the normal life and activities of the community and to avoid separation from family and tribal life. Few opportunities for urban employment exist but within the normal economy of the villages there are opportunities for the blind to make a modest livelihood.

145. The aim would be to establish, during the next three years, a series of up to six village training centres for the blind in the principal villages in the various tribal reserves. Such centres would consist of a large hut to be used as a training school and workshop with up to twelve huts for residential purposes. Such centres would endeavour to train at least thirty blind adults annually.

146. The proposals are now under consideration.

Arthropod Surveys

147. Dr. F. Zumpt, senior entomologist, South African Institute for Medical Research, visited the territory from 13th December, 1954—27th January, 1955; from 3rd October, 1955—10th October, 1955, and again during December, 1955 and January, 1956.

148. The first visit was devoted mainly to collecting and identifying arthropods parasitizing wild running animals. A total of 90 host species (143 specimens) were examined. Many more species were discovered of Ixodoides (ticks), Phthiraptera (lice) and Siphonaptera (fleas). The animals examined and the parasites found on them are listed in Annexure II. Blood smears were also taken for examination from most of the hosts. A collection of 264 Mallophaga and Anoplura from birds and mammals was sent to the British Museum. The Museum also assisted with the identification of many specimens.

149. The second visit was to investigate and discuss the opportunities for establishing a field station from which a survey of native huts could be made and an examination of domestic animals for ticks undertaken. From the Kanye district a number of wild animals were collected and checked for parasites (Annexure III). Domesticated animals and native huts were also examined. The findings are detailed in Annexure IV.

150. The third visit had as its purpose the following:—

- (a) Examination of native huts in various areas, especially for the presence of *Ornithodoros moubata* which would subsequently be checked for infection with spirochaetes in the South African Institute for Medical Research, *Cordylobia anthropophaga*, *Auchmeromyia luteola*, fleas, mosquitoes, bugs and lice.
- (b) Examination of human blood slides for the presence of spirochaeta of relapsing fever, malaria, etc.
- (c) Examination of domesticated animals for ticks and other ectoparasites.
- (d) Examination of slaughtered cattle at the Lobatsi and Francistown abattoirs for the presence of ecto- and endoparasites.
- (e) Examination of bush-babies in the Nata district for infection with yellow fever.
- (f) Continuation of the survey of wild animals for parasitic arthropods.

The reports of the third visit were not available at the time of compiling this report.

151. The government is grateful to Dr. Zumpt and to the director of the South African Institute for Medical Research for carrying out this work and for making the reports available.

W.H.O. and UNICEF

152. Representatives of both organisations visited the territory during the first half of the year.

153. The director of medical services attended the fifth session of the regional committee for Africa of the World Health Organisation in Madagascar in September.

154. The following is extracted from the W.H.O. budget for 1956 and 1957 and deals with the allocations included in the budget for this territory:—

155. The main schemes contemplated are the following:—

(a) *Tuberculosis*

The visit of the assessment team has already been referred to at paragraph 93. It is anticipated that following this visit W.H.O. will provide some medical and nursing staff and UNICEF will provide the funds to conduct a B.C.G. vaccination campaign.

(b) *Tsetse-Fly Control*

Under technical assistance \$16,700 has been made available. Reference was made at paragraph 84 to the visit of Dr. E. A. Lewis during 1955 and provision has been made for other consultants to visit the tsetse area as required.

(c) *Treponematoses*

The project has been described at paragraphs 96 - 101. Between 1955 - 1957, W.H.O. has allocated \$32,977 for this campaign and UNICEF a further \$43,900 for supplies and equipment, with additional provision for the further expenditure of \$20,000 in 1957 should this be necessary.

(d) *Diphtheria and Whooping Cough Inoculation Campaign*

This is referred to at paragraphs 33 - 36.

(e) *Development of Rural Health Services and Health Education*

At present general nurse training is carried out at all four government hospitals and midwifery training at only one (Serowe) where the facilities for such training are adequate. The arrangement aimed at is to maintain midwifery training at Serowe and to concentrate general nurse training at the Lobatsi government hospital. The future plans of the medical department envisage considerable expansion in the provision of maternity and child welfare clinics based on a number of rural health centres. Adequate trained staff are necessary for this work.

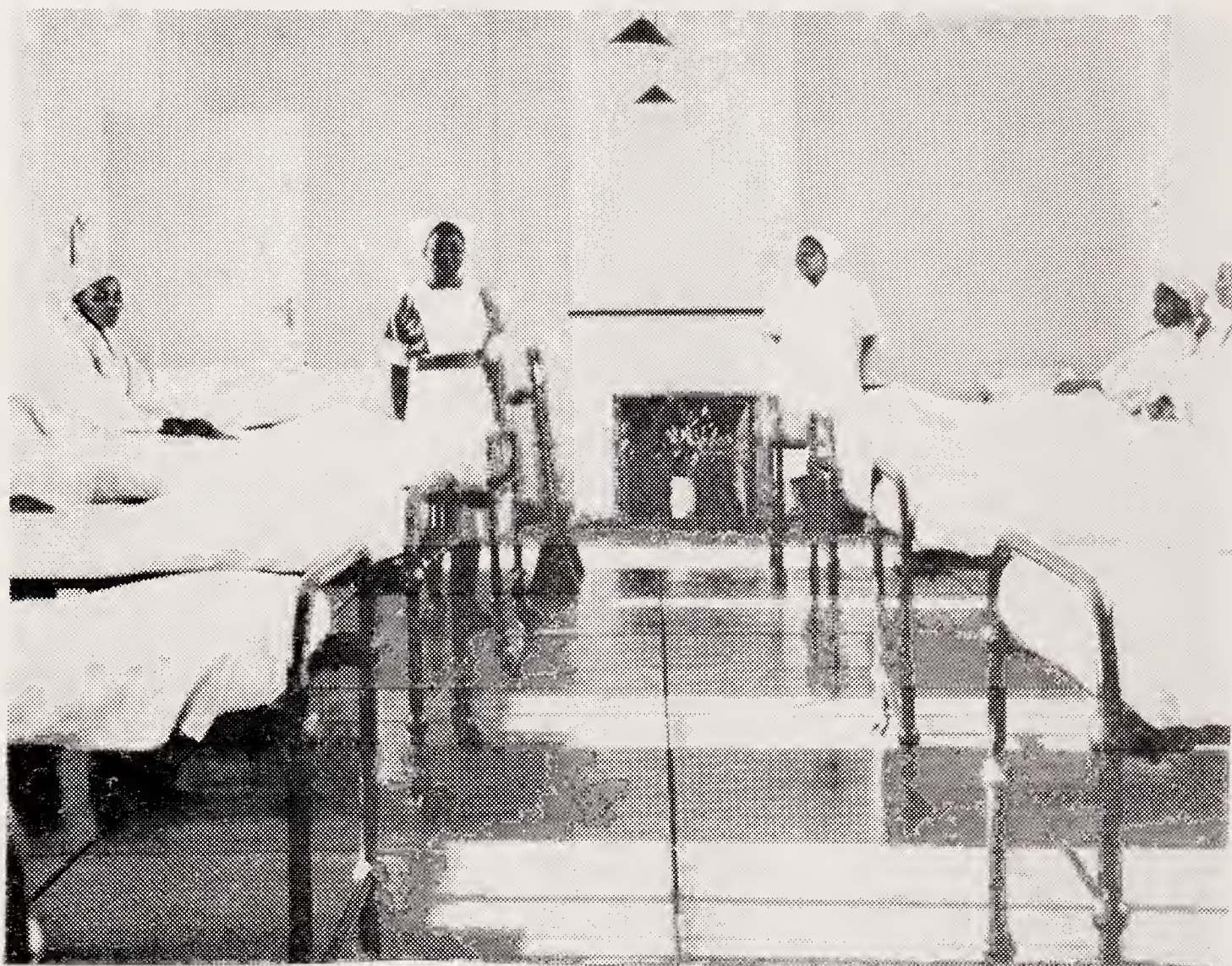
W.H.O. are now providing for one and eventually two sister tutors on a temporary basis and also a fellowship to enable a nursing sister from the territory to undergo a sister tutor's course of training in the United Kingdom.

W.H.O. will also provide an experienced health educator in 1956/57 to set up a centre in the Protectorate from which propaganda specimens can be supplied to schools, hospitals, villages, etc., and to train local health personnel in this very important aspect of preventive medicine.

(f) *Environmental Sanitation Survey*

It is proposed to send an expert to the Bechuanaland Protectorate to study its problems and advise on the best methods of improving water supplies and refuse and night-soil disposal.

156. The technical discussion at the fifth regional meeting was on the subject of "The Health Problems of the Pre-School Age Child in Africa and the Role of the Nurse in the Solution of those Problems". The director of medical services read a paper on this subject.



Government Hospital: African Ward



Government Hospital



Government Hospital: Dining Room, African Nurses' Quarters



Government Hospital: T.B. Shelter

SECTION VI — HOSPITALS AND DISPENSARIES

Out-Patients

157.

TABLE XIII

			1955	1954
First Attendances	...	...	116,442	115,688
Subsequent Attendances	...	...	329,247	256,186
Total	...	...	<u>445,689</u>	<u>371,874</u>

This reflects an increase of 73,815 in the number of patients attended to as compared with the figure for the previous year.

In-Patients

158. The number of admissions was 10,146 which, together with 352 remaining in hospital at the end of 1954, gives a total of 10,498 patients treated in hospital during the year, an increase of 362 as compared with the figure for the previous year.

159. At the end of 1955 the number of beds available in Protectorate hospitals, both government and missionary, was 584 as compared with 560 in 1954. Of this number 30 were for Europeans, 469 for Africans, and there were 85 cots. This means that there are now 1.9 beds per 1,000 population.

160. During 1955 there were 13 government doctors (including the director of medical services and the medical officer of health), six missionary and one private practitioner in active practice, i.e. one doctor for every 14,800 persons.

161. Leading hospital statistics are given in Table XIV.

TABLE XIV

HOSPITAL STATISTICS

<i>Hospital</i>				<i>Beds</i>		<i>Cots</i>	<i>Patients</i>		<i>Operations</i>	
			<i>European</i>	<i>African</i>		<i>Admissions</i>	<i>Deaths</i>	<i>Major</i>	<i>Minor</i>	
Francistown	6	40	12	1,635	64	39	752
Kanye Medical Mission (S.D.A.)	2	64	6	1,227	29	99	294
Kanye Moffat Hospital (U.F.C.)	1	26	6	592	16	42	80
Kazungula	—	6	—	—	—	—	—
Khale (Roman Catholic Mission)	—	5	—	19	—	—	—
Lobatsi (including Mental Home)	11	115	6	1,572	44	254	273
Mahalapye	—	12	1	121	2	4	357
Maun	5	31	2	649	17	12	138
Maun Maternity Centre (L.M.S.)	—	12	10	121	2	—	—
Mochudi (D.R.C.)	—	18	3	421	5	—	49
Molepolole (U.F.C.)	—	48	12	1,149	9	23	166
Ramoutsa (Hermannsberg Mission)	—	13	—	143	—	—	—
Serowe	5	79	27	2,497	44	175	169
Gaberones	—	—	—	—	—	—	63
				30	469	85	10,146	232	648	2,341

Dispensaries

162. Although equipment for the new centres at Totome and Maetengwe in the Bokalala area was purchased, the units, which are being constructed by tribal labour and with tribal funds, were not completed at the end of the year. An African dispenser or health assistant will be posted there when they are ready for occupation.

163. In December a senior service district nurse assumed duty at Ghanzi, 200 miles from the nearest government hospital and medical officer at Maun. Quarters are in the course of construction. Temporary buildings are in use as a dispensary but provision has been made for the construction of a more elaborate type of dispensary with in-patient accommodation for about six persons. An ambulance and driver has been made available for the nurse who provides maternal and child welfare services in addition to the ordinary curative measures in a district remote from medical attention. She is in radio contact with the medical officer at Maun. This appointment promises also to do much to assist in the welfare of the children at the Ghanzi European Boarding School which now houses 48 students.

164. In the absence of a medical missionary at the Dutch Reformed Church Mission hospital, Mochudi, for almost the entire year, the government medical officer, Gaberones, visited Mochudi once weekly and at other times when necessary.

165. The medical officer, Serowe, visited the Botletle river area on two occasions and the Tswapong area also twice. He investigated an outbreak of malaria at Rakops in the course of which clinics were held at Rakops, Lothlakane and Mosu. Moeng College was visited monthly throughout the year and special reports submitted to the education authorities.

166. District visits from Maun were restricted because one medical officer was on overseas leave for most of the year and the excessive flooding during the first half of the year cut all exits from Maun to wheeled traffic. On these occasions a local plane was used to get about.

167. Nokaneng was visited by air in June when smallpox was suspected, and Shakawe was visited once weekly from June using Wenela aircraft. A clinic was held on each visit.

168. Ghanzi was visited on eight occasions and on one occasion a road trip as far as Nojane was made.

169. The medical superintendent of the Kanye Moffat Hospital visited Moshupa and Moshaneng weekly and Ranaka, Digawana, Molapoabojang, Mmathete, Magweraapitse, Mogomane, Pitsani-Molopo and Tshidilamolomo at three-weekly intervals. It is proposed to extend the visits to Mabule, 12 miles west of Tshidilamolomo along the Molopo river.

170. Government dispensaries now exist at the following centres and all are visited by a medical officer:—

*Dikgatlong	Machaneng	Rakops
Gabane	Mahalapye	Ramoutsa
Gaberones	*Makobo's Kraal	Sefhare
Ghanzi	*Moeng	*Sehitwa
*Good Hope	*Mokane	Shakawe
*Kalamari	Nokaneng	Shoshong
Kalkfontein	Palapye	Tsau

* No government buildings available but accommodation improvised for visits which take place at least monthly, usually weekly.

171. The following outlying centres were visited by missionary medical officers at regular intervals:—
 Ga-Thamaga, Moshupa, Kakia, Tshane, Ranaka, Digawana, Molapoabolang, Mmathete, Magweraapitse, Mogomane, Pitsani-Molopo, Tshidlamolomo and Moshaneng.

Nursing Examinations

172. The 1955 nursing examination results were as follows:—

	<i>Number of Candidates</i>	<i>Passed</i>	<i>Failed</i>
Final General Medical and Surgical	16	13	3
Midwifery	6	6	—
Second Year	23	11	12
First Year	24	18	6

There were ten passes with merit and one pass with honours.

Colonial Development and Welfare Fund Schemes

173. C. D. & W. SCHEME D.1037 for the development of medical services had, at the end of the year, only three months before termination. Three new ambulances were purchased during 1955 at a cost of £2,900. The salaries of one senior service health inspector, one sanitary inspector, one driver and one labourer were also paid from this scheme.

174. The only structure still to be completed under this scheme is the new health centre at Gaberones at an estimated cost of £5,500. Building operations were begun towards the end of 1955 and it is hoped to have the unit ready for occupation about mid-1956.

175. C. D. & W. SCHEME D.2014 was a contribution towards the territory's expenses in connection with the W.H.O./UNICEF sponsored treponematosi s campaign already referred to. Government was not able to recruit a field medical officer for this work as provided for in the scheme but paramedical and other subsidiary personnel were recruited and paid from this source.

Habit-Forming Drugs

176. Import certificates numbering eight were issued during 1955.

177. The following habit-forming drugs were imported during the year:—

Morphine	1,078.3 grammes
Cocaine... ..	95.3 grammes
Indian Hemp	22.4 grammes
Pethidine	5.58 grammes

X-Ray Examinations

178. Two thousand, seven hundred and fifty-three x-ray examinations were conducted.

Medical Examinations on First Appointment

179. Two hundred and nine detailed examinations were made and in each instance an x-ray report was submitted as well.

Extracts from District Reports

180. *The medical missionary, Moffat Hospital, Kanye* writes of the increasing number of ante-natal attendances and mothers seeking admission for their confinements. It frequently became necessary to admit maternity cases to the general ward, an unsatisfactory arrangement. The average number of Africans employed at the Moshanene Asbestos Mine was 520, free medical attention being provided for these employees. Minor injuries were frequent. Epidemics of measles and whooping cough were rife and mortality was reported to be high. The hospital was redecorated by the public works department and a new laundry was completed.

181. *The sister-in-charge, Maun Maternity Centre*, had her first year's full working.

182. *The medical missionary, Molepolole*, reports 331 babies born in hospital during the year and 993 new patients seeking ante-natal advice. Out-patients numbering 29,698 were attended to.

183. *The government medical officer, Maun*, records that 1,524 yellow fever inoculations were given to mine recruits at Shakawe and a further 650 to recruits at Maun in terms of the agreement with the Witwatersrand Native Labour Association. A further 175 were given to residents in the district. The medical officer flies to Shakawe once weekly to examine recruits and perform the inoculations and takes the opportunity of conducting a clinic at the same time. A storm caused considerable damage to the dispensary at Tsau and Nokaneng. Owing to flood conditions it became impossible for Rakops dispensary to be visited from Maun. There are four African dispensers or health assistants in charge of various units in this district and the medical officer tries to visit them as often as possible. In December an outbreak of smallpox near Runtu in the Caprivi Strip stopped all recruiting from Angola. The school-children at the Maun European school were medically examined during the year.

184. *The government medical officer, Serowe*, states that with accommodation for 111 adults, children and infants, 2,497 persons were treated in hospital. Forty-seven thousand, six hundred and fifty-six out-patient attendances were recorded, an average of 130 persons for every day of the year. Six hundred and seventy-two babies were born in hospital and 871 ante-natal patients attending for the first time subsequently made a further 6,633 visits. Of the 672 babies born, 75 had some complication of delivery and a further 84 were premature. Three hundred and forty ante-natal first attendances showed a positive Wasserman reaction, i.e. 39% of the total first attendances, a figure similar to that reported by other observers in this district. The treponematoses mass inoculation campaign reached this reserve at the end of the year under review.

185. *The government medical officer, Mahalapye*, reports that gynaecological conditions constituted more than 10% of the total number of first attendances; simple disorders of the bowel a further 10%; but by contrast the deficiency diseases accounted for less than 1% of the total. Considerable improvements were effected to this unit and the number of in-patient beds increased from eight to twelve. At Dikgatlong an African has built a very creditable room, at his own expense, to encourage the medical officer to conduct a regular clinic there. He has also furnished it with chairs, wash-stand, curtains and a screen. A new hut has also been provided by the tribe at Mokane. The ambulance had covered 45,000 miles of very rough travelling by the end of the year.

186. *The government medical officer, Francistown*, states that anti-smallpox vaccination campaigns were conducted as a precautionary measure. The nursing staff position was most unstable, nine locum nursing sisters being employed at various times. The hospital and out-buildings were renovated and a new dressing-room was built.

187. *The government medical officer, Gaberones*, is away from his own headquarters in the district for more than half the time. Regular courses of lectures on "First Aid to the Injured" were given to police recruits at the depot. An outbreak of measles from Gabane was notable for the large number of children developing broncho-pneumonia as a complication.

188. *The medical missionary, Kanye Seventh Day Adventist Hospital*, reports that at last the hospital is now ensured of a regular, adequate and

potable water supply. It is still intended to purchase additional pumping equipment and to build a water tower to serve the hospital. The problems of sewerage and effluent disposal give some cause for concern. Difficulty was encountered in manning the Tshane dispensary on a permanent basis.

189. *The government medical officer, Lobatsi*, records that the increased number of both out-patients and in-patients are a reflection of the growth of the African population of Lobatsi since the opening of the Colonial Development Corporation Abattoir. This increase, being chiefly due to labour requirements, and of a permanent nature, tends to level out the former seasonal fluctuations in the hospital admissions with the result that the wards are nearly always full. The variety of disorders dealt with remains much the same, but it is noteworthy, with regard to surgical work, that the proportion of major operations, such as pan-hysterectomies, thyroidectomies, ereteric transplantations and many others which require specialised pre- and post-operative treatment, is steadily increasing, as is the number of ophthalmic operations for the relief of cataract. Accommodation for pulmonary tuberculosics remained taxed throughout the year and as an adjunct a clinic for ambulatory cases undergoing treatment with streptomycin and PAS was established.

Finance

190. The total revenue from government hospitals and dispensary fees was £7,523 5s. 8d. as compared with £7,437 8s. 3d. the previous year, as follows:—

Francistown	...	...	£1,533	1	8
Gaberones	...	...	514	14	0
Lobatsi	...	...	1,276	18	0
Mafeking	...	...	44	7	6
Mahalapye	...	...	910	2	0
Maun	...	...	1,334	11	0
Serowe	...	...	1,909	11	6
Total	...	...	£7,523	5	8

191. The total estimated ordinary expenditure of the department for the financial year ending 31st March, 1956, was:—

Personal Emoluments...	...	...	...	£54,720
Travelling Expenses	...	...	...	3,126
Maintenance of Vehicles	...	...	...	3,500
Upkeep of hospitals and dispensaries	...	...	...	9,600
Pathological Investigations	...	...	...	1,000
Specialist Medical Attention	...	...	...	500
Maintenance of Lunatics	...	...	...	2,000
General Stores	...	...	...	16,230
Grants to Missions and Hospitals	...	...	...	2,361
Public Health Measures	...	...	...	4,000
Miners' Pthisis Patients	...	...	...	5
Treatment of Indigent persons in Union Hospitals	...	...	...	50
Maintenance of x-ray Plants	...	...	...	400
Expenses of High Commission Territories	...	...	...	...
Nursing Council	...	...	...	150
Transport	...	...	...	2,500
Maintenance of Abattoirs	...	...	...	100
Office and Furniture Equipment	...	...	...	215
Total	...	...	...	£100,457

192. The total estimated ordinary revenue of the Bechuanaland Protectorate during the period 1955/56 was £919,525. The proportion of estimated ordinary medical expenditure to ordinary estimated revenue of the Protectorate was 10.81 %.

193. The total estimated ordinary expenditure of the Bechuanaland Protectorate during the period 1955/56 was £1,173,373. The proportion of estimated ordinary medical expenditure to estimated ordinary expenditure of the Protectorate was 8.56 %.

194. This report will be incomplete without an expression of appreciation of the assistance and co-operation accorded by colleagues in various departments and in the district administration. The medical staff, government and missionary, senior and junior, continued to provide the loyal and co-operative assistance which has always been such a feature. To them all I am deeply grateful.

M. L. FREEDMAN,
Director of Medical Services.

MAFEKING,
19th March, 1956.

BECHUANALAND PROTECTORATE

ANNEXURE I

RETURN OF DISEASES, INJURIES AND CAUSES OF DEATH FOR THE YEAR 1955

IN-PATIENTS				OUT-PATIENTS			
DISEASES	*Remaining in Hospital at end of 1954	Yearly Total		†Total [†] Cases Treated	‡Remaining in Hospital at end of 1955	Male	Female
		Admissions	Deaths				
A.							
1. Tuberculosis of respiratory system ...	75	310	15	385	77	502	579
2. Tuberculosis of meninges and central nervous system ...	1	18	1	19	2	4	6
3. Tuberculosis of intestines, peritoneum and mesenteric glands ...	5	23	4	28	3	25	32
4. Tuberculosis of bones and joints ...	19	37	—	56	13	38	28
5. Tuberculosis, all other forms ...	1	41	—	42	3	167	168
6. Congenital syphilis ...	2	12	1	14	—	550	637
7. Early syphilis ...	—	19	—	19	—	836	1,034
8. Tabes dorsalis ...	—	5	—	5	—	1	—
9. General paralysis of insane ...	—	—	—	—	—	1	—
10. All other syphilis ...	—	34	2	34	1	1,562	2,567
11. Gonococcal infections ...	2	111	1	113	3	2,453	3,631
12. Typhoid fever ...	1	6	1	7	—	2	4
13. Paratyphoid fever and other Salmonella infections ...	—	—	—	—	—	—	—
14. Cholera ...	—	—	—	—	—	—	—
15. Brucellosis (undulant fever) ...	—	—	—	—	—	—	—
16. (a) Bacillary dysentery ...	2	37	5	39	2	276	257
(b) Amoebiasis ...	—	23	1	23	2	24	16
(c) Other unspecified forms of dysentery ...	1	12	—	13	—	275	337
17. Scarlet fever ...	—	—	—	—	—	4	3
18. Streptococcal sore throat ...	—	36	—	36	—	613	790
19. Erysipelas ...	—	—	—	—	—	—	—
20. Septicaemia and pyaemia ...	—	4	1	4	—	6	—
21. Diphtheria ...	2	41	12	43	1	31	17
22. Whooping cough ...	4	65	4	69	2	650	780
23. Meningococcal infections ...	—	10	1	10	—	3	8
24. Plague ...	—	—	—	—	—	—	—
25. Leprosy ...	1	1	—	2	1	16	16
26. Tetanus ...	1	5	2	6	1	4	2

BECHUANALAND PROTECTORATE

RETURN OF DISEASES, INJURIES AND CAUSES OF DEATH FOR THE YEAR 1955

DISEASES	IN-PATIENTS				OUT-PATIENTS			
	*Remaining in Hospital at end of 1954	Yearly Total		†Total Cases Treated	‡Remaining in Hospital at end of 1955	Male	Female	
		Admissions	Deaths					
<i>Brought forward</i>	118	1,290	56	1,408	119	9,788	12,882	
(e) Relapsing fever	—	3	—	3	—	24	34	
(f) Leptospirosis icterohaemorrhagica (Weil's disease)	—	—	—	—	—	—	—	
(g) Yaws	—	—	—	—	—	3	—	
(h) Chickenpox	—	7	—	7	1	83	92	
(i) Dengue	—	—	—	—	—	—	—	
(j) Trachoma	—	9	—	9	—	22	44	
(k) Sandfly fever	—	—	—	—	—	—	—	
(l) Leishmaniasis	—	—	—	—	—	—	—	
(m) (a) Trypanosomiasis gambiensis (b) Trypanosomiasis rhodesiensis (c) Other and unspesified Trypanoso- miasis	—	4	—	4	2	—	—	
(n) Dermatophytosis... ..	—	—	—	—	—	—	—	
(o) Scabies	—	27	—	27	—	5	9	
(p) All other diseases classified as infective and parasitic	—	—	—	—	—	1,465	1,737	
44. Malignant neoplasm of buccal cavity and pharynx	—	—	—	—	—	41	35	
45. Malignant neoplasm of oesophagus	1	1	—	1	—	38	57	
46. Malignant neoplasm of stomach	—	4	—	4	—	2	2	
47. Malignant neoplasm of intestine, except rectum	—	3	1	3	—	—	2	
48. Malignant neoplasm of rectum	—	2	1	2	—	3	2	
49. Malignant neoplasm of larynx	—	1	—	1	—	—	1	
50. Malignant neoplasm of trachea, and of bron- chus and lung not specified as secondary	—	—	—	—	—	—	1	
51. Malignant neoplasm of breast	—	3	—	3	—	—	11	
52. Malignant neoplasm of cervix uteri	1	10	1	11	1	—	20	
53. Malignant neoplasm of other and unspeci- fied parts of uterus	—	4	1	4	2	—	11	

54.	Malignant neoplasm of prostate ...	...	1	—	—	1	—	—	2	—
55.	Malignant neoplasm of skin ...	...	8	—	—	8	—	—	13	31
56.	Malignant neoplasm of bone and connective tissue ...	...	4	1	—	5	—	—	6	4
57.	Malignant neoplasm of all other and unspecified sites ...	...	14	—	1	14	—	—	45	31
58.	Leukaemia and aleukaemia...	...	1	—	—	1	—	—	—	1
59.	Lymphosarcoma and other neoplasms of lymphatic and haematopoietic system ...	...	—	—	—	—	—	—	—	—
60.	Benign neoplasms and neoplasms of unspecified nature ...	...	135	3	2	138	4	115	314	7
61.	Nontoxic goitre ...	...	2	—	1	2	—	—	—	6
62.	Thyrototoxicosis with or without goitre ...	...	1	—	—	1	—	—	—	—
63.	Diabetes mellitus ...	...	—	—	—	—	—	—	—	—
64.	(a) Beriberi ...	...	1	—	—	1	—	—	23	29
	(b) Pellagra ...	...	28	—	—	28	—	240	311	311
	(c) Scurvy ...	...	5	—	—	5	—	170	207	207
	(d) Other deficiency states ...	...	66	3	9	69	3	485	760	760
65.	(a) Pernicious and other hyperchromic anaemias ...	...	5	1	—	6	—	40	42	42
	(b) Iron deficiency anaemias (hypochromic)	...	11	—	—	11	3	117	573	573
	(c) Other specified and unspecified anaemias	...	5	—	—	5	—	113	293	293
66.	(a) Asthma ...	...	98	—	—	98	—	416	559	559
	(b) All other allergic disorder, endocrine, metabolic and blood diseases ...	...	37	—	3	37	3	341	398	398
67.	Psychoses ...	...	16	21	—	37	24	21	24	24
68.	Psychoneuroses and disorders of personality	...	12	1	—	13	2	64	121	121
69.	Mental deficiency ...	...	8	—	—	8	—	18	20	20
70.	Vascular lesions affecting central nervous system ...	...	14	—	3	14	—	18	21	21
71.	Nonmeningococcal meningitis ...	...	9	—	2	9	—	4	3	3
72.	Multiple sclerosis ...	...	—	—	—	—	—	—	—	—
73.	Epilepsy ...	...	16	2	—	18	1	59	64	64
74.	Inflammatory diseases of eye ...	...	91	2	—	93	4	1,084	1,256	1,256
75.	Cataract ...	...	21	1	—	22	—	39	38	38
76.	Glaucoma ...	...	3	—	—	3	—	11	9	9
77.	(a) Otitis externa ...	...	5	—	—	5	—	179	194	194
	(b) Otitis media and mastoiditis ...	...	29	—	—	29	2	354	407	407
	(c) Other inflammatory diseases of ear ...	...	2	—	—	2	—	275	386	386
<i>Total carried forward</i> ...		...	2,018	155	81	2,173	175	15,780	21,091	21,091

BECHUANALAND PROTECTORATE

RETURN OF DISEASES, INJURIES AND CAUSES OF DEATH FOR THE YEAR 1955

DISEASES	IN-PATIENTS				OUT-PATIENTS		
	*Remaining in Hospital at end of 1954	Yearly Total		†Total Cases Treated	#Remaining in Hospital at end of 1955	Male	Female
		Admissions	Deaths				
<i>Brought forward</i>	155	2,018	81	2,173	175	15,780	21,091
78. (a) All other diseases and conditions of eye	—	28	—	28	—	430	482
(b) All other diseases of the nervous system	—	13	—	13	1	218	268
and sense organs	3	20	—	23	—	110	108
79. Rheumatic fever	—	64	9	64	2	90	106
80. Chronic rheumatic heart disease	1	23	6	24	—	33	39
81. Arteriosclerotic and degenerative heart	8	34	8	42	—	231	280
disease	—	27	6	27	2	49	28
82. Other disease of heart	—	32	1	32	—	46	50
83. Hypertension with heart disease	—	11	1	11	1	9	8
84. Hypertension without mention of heart ...	—	29	2	29	1	85	107
85. Diseases of arteries	3	168	—	171	3	2,001	2,386
86. Other diseases of circulatory system ...	2	50	—	52	—	728	871
87. Acute upper respiratory infections	6	226	10	232	3	331	339
88. Influenza	3	247	16	250	7	258	293
89. Lobar pneumonia	1	72	1	73	—	129	125
90. Bronchopneumonia	1	47	1	48	—	957	1,028
91. Primary atypical, other and unspecified	—	100	—	100	—	1,824	2,072
pneumonia	—	94	—	94	3	393	585
92. Acute bronchitis	1	8	4	9	1	7	3
93. Bronchitis, chronic and unqualified	8	46	—	54	1	82	94
94. Hypertrophy of tonsils and adenoids ...	—	—	—	—	—	24	—
95. Empyema and abscess of lung	—	33	1	33	—	968	1,172
96. Pleurisy	—	8	—	8	—	960	1,372
97. (a) Pneumoconiosis	—	35	1	35	—	413	441
(b) All other respiratory diseases	—	6	—	6	—	11	—
98. Dental caries	—	1	—	1	—	15	17
(b) All other diseases of teeth and support-	—	—	—	—	—	—	—
ing structures	—	—	—	—	—	—	—
99. Ulcer of stomach	—	—	—	—	—	—	—
100. Ulcer of duodenum	—	—	—	—	—	—	—

101.	Gastritis and duodenitis	...	...	...	37	1	37	—	555	721
102.	Appendicitis	...	...	...	79	2	81	1	52	65
103.	Intestinal obstruction and hernia	...	...	...	32	2	33	—	241	242
104.	(a) Gastro-enteritis and colitis between 4 weeks and 2 years	—	—	—	100	11	100	2	1,209	1,289
	(b) Gastro-enteritis and colitis, ages 2 years and over	—	—	—	106	—	106	—	738	791
	(c) Chronic enteritis and ulcerative colitis	—	—	—	1	—	1	—	42	59
105.	Cirrhosis of liver	1	3	—	12	—	13	—	35	31
106.	Cholelithiasis and cholecystitis	—	—	—	7	—	7	—	29	46
107.	Other diseases of digestive system	4	—	2	80	2	84	2	2,806	4,626
108.	Acute nephritis	—	—	2	12	2	12	—	66	49
109.	Chronic, other and unspecified nephritis	2	2	2	12	2	14	1	148	94
110.	Infections of kidney	—	—	—	35	—	35	—	199	249
111.	Calculi of urinary system	—	—	—	2	—	2	—	13	34
112.	Hyperplasia of prostate	1	—	—	9	—	10	1	10	—
113.	Diseases of breast	1	—	—	20	—	21	—	—	237
114.	(a) Hydrocele	—	—	—	14	—	14	—	35	—
	(b) Disorders of menstruation	1	—	—	115	—	116	—	—	4,107
	(c) All other disease of the genito-urinary system	10	1	1	318	—	328	8	1,059	4,261
115.	Sepsis of pregnancy, childbirth and the puerperium	—	—	—	38	—	38	1	—	74
116.	Toxaemias of pregnancy and the puerperium	1	—	—	10	—	11	1	—	29
117.	Haemorrhage of pregnancy and childbirth	4	1	—	50	—	54	—	—	41
118.	Abortion without mention of sepsis or toxaemia	3	1	1	117	—	120	5	—	248
119.	Abortion with sepsis	—	—	—	26	—	26	1	—	42
120.	(a) Other complications of pregnancy, childbirth and the puerperium	8	10	10	140	—	148	9	—	1,062
	(b) Delivery without complications	35	—	—	1,740	—	1,775	43	—	—
121.	Infections of skin and subcutaneous tissue	4	—	—	170	—	174	2	2,852	3,495
122.	Arthritis and spondylitis	1	—	—	44	—	45	2	423	502
123.	Muscular rheumatism and rheumatism, unspecified	2	—	—	59	—	61	—	1,919	2,279
124.	Osteomyelitis and periostitis	5	1	1	30	—	35	3	65	29
125.	Ankylosis and acquired musculoskeletal deformities	1	—	—	5	—	6	1	15	11
<i>Total carried forward</i>					6,860	187	7,139	283	38,693	58,078

RETURN OF DISEASES, INJURIES AND CAUSES OF DEATH FOR THE YEAR 1955

36

141.	Accidental falls	...	...	...	...	4	194	1	198	8	786	564
142.	Accident caused by machinery	...	...	...	...	1	16	—	17	2	64	12
143.	Accident caused by fire and explosion of combustible material	...	...	...	...	—	76	9	76	5	522	382
144.	Accident caused by hot substance, corrosive liquid, steam and radiation	...	...	...	...	5	73	1	78	3	160	144
145.	Accident caused by firearm	...	...	...	...	—	8	1	8	—	16	—
146.	Accidental drowning and submersion	...	...	...	...	—	—	—	—	—	—	—
147.	Foreign body entering eye and adnexa	...	...	...	...	2	13	—	15	1	117	78
	Foreign body entering other orifice	...	...	...	...	—	28	—	28	—	74	68
	Accidents caused by bites and stings of venomous animals and insects	...	...	...	...	2	42	—	44	2	138	100
	Other accidents caused by animals...	...	...	...	...	—	41	—	41	6	222	75
	All other accidental causes	...	...	...	...	7	96	—	103	6	593	329
148.	Suicide and self-inflicted injury	...	...	...	...	1	6	1	7	—	8	4
149.	Homicide and injury purposely inflicted by other persons (not in war)	...	...	...	...	4	116	4	120	3	223	223
150.	Injury resulting from operations of war	...	...	...	...	—	—	—	—	—	—	—
	<i>TOTAL</i>	...	...	...	...	352	10,146	232	10,498	381	45,670	70,772

This form is adapted in accordance with the “Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death, World Health Organisation, Geneva, 1948).

* i.e. the year previous to that for which the return is made.

† “Total cases treated” will, of course, include those remaining in Hospital at the end of the previous year.

‡ The figures in this column to be carried on to the next year’s Return.

ANNEXURE II
IDENTIFICATION OF SPECIMENS

Date Collected	KIND OF SPECIMENS—FLEAS		IDENTIFICATION OF SPECIMENS					
	Host	Locality	Name	M.	F.	N.	L.	Identifiers number
4.1.55	Phacochoerus aethiops ...	Nr. Lake Ngami ...	Echidnophaga ...	—	12			
“	Suricata Suricata ...	Toteng, nr. Lake Ngami ...	Echidnophaga gallinacea ...	1	—			
			Synosternus caffer ...	3	3			
15.1.55	Geosciurus unauris ...	Nr. Ghanzi ...	Ctenocephalides connatus ...	4	1			
			Echidnophaga gallinacea ...	7	13			

Collected	KIND OF SPECIMENS—LICE		IDENTIFICATION OF SPECIMENS					
	Host	Locality	Name	M.	F.	N.	L.	Identifiers number
15.12.54	Corythaixoides concolor ...	Mosetsi (Francistown-Nata)	Splendorofula sp. + ...	...	1			
18.12.54	Bubalornis albirostris ...	Mosetsi ...	Myrsidea sp. + ...	...	1	2		
18.12.54	Milvus Migrans ...	Mosetsi ...	Colpocephalum tricinctum Nitzsch... Craspedorrhynchus spathulatus(Giebel Degeeriella regalis (Giebel) ... Laemobothrion nymphs ...	...			
19.12.54	Numida mitrata ...	Mosetsi ...	Gonoides nymphs ... Numidicola antennatus (Kell. & Paine) Clayia theresae Hopkins ...	...			
21.12.54	Milvus aegyptius ...	Mosetsi ...	Degeeriella regalis (Giebel) ... Laemobothrion maximum titan Piaget	...				
22.12.54	Corvus albus ...	Mosetsi ...	Bruelia quadrangularis ... Philopterus albidus (Piaget) ...	...			

ANNEXURE II
IDENTIFICATION OF SPECIMENS

Date Collected	KIND OF SPECIMENS—TICKS		IDENTIFICATION OF SPECIMENS				
	Host	Locality	Name	M.	F.	N.	L.
25.1.55	Oryx gazella ...	...	Hyalomma transiens Schulze ...	5	1		
			Rhipicephalus tricuspidatus Donitz ...	14	9		
			Rhipicephalus s. sanguineus (Lat.) ...	3	2		
20.1.55	Alcelaphus caama ...	Nr. Tsane ...	Rhipicephalus s. sanguineus (Lat.) ...	1			
30.12.54	Crecopsis egregaria ...	Maun ...	Haemaphysalis h. hoodi Warb. & Nutt		1		
30.12.54	Centropus senegalensis ...	Maun ...	Haemaphysalis h. hoodi Warb. & Nutt	2	1		
			Hyalomma rufipes Koch ...		1		
2.1.55	Laniarius neglectus ...	Maun ...	Haemaphysalis h. hoodi Warb. & Nutt		1		
23.12.54	Pternistis swainsoni ...	Maun ...	Haemaphysalis h. hoodi Warb. & Nutt	4			
30.12.54	Crypteropus afer ...	Maun ...	Rhipicephalus s. sanguineus (Lat.) ...	1			
			Rhipicephalus lunulatus Neum ...	12	1		
18.12.54	Paraxerus cepapi ...	Mosetsi (Francistown-Nata)	Haemaphysalis leachi indica Warb....	8	2	1	
18.12.54	Centropus senegalensis ...	Mosetsi (Francistown-Nata)	Amblyomma hebraeum Koch ...			2	1
18.12.54	Cuculus canoris ...	Mosetsi (Francistown-Nata)	Hyalomma r. rufipes Koch ...				2
18.12.54	Lophoceros erythrorhynchus	Mosetsi (Francistown-Nata)	Amblyomma hebraeum Koch ...			1	
19.12.54	Numida mitrata ...	Mosetsi (Francistown-Nata)	Amblyomma hebraeum Koch ...				7
8.1.55	Thos Mesomelas ...	Near Lake Ngami ...	Haemaphysalis leachi indica Warb.	1			
			Rhipicephalus lunulatus Neum ...	2	3		
			Rhipicephalus s. sanguineus (Lat.) ...	3	2		
			Rhipicephalus s. simus Koch ...		2		

4.1.55	Suricata Suricata ...	Near Lake Ngami ...	Harmaphysalis leachi indica Warb. ... Rhipicephalus theileri Bedford & Hewitt ... Rhipicephalus appendiculatus Neu- mann ...	1 1	4	1
4.1.55	Lophoceros erythrorhynchus	Near Lake Ngami ...	Amblyomma hebraeu Koch ...		1	4
6.1.55	Equus burchelli ...	Near Lake Ngami ...	Hyalomma r. rufipes Koch ... Hyalomma transiens Schulze ... Rhipicephalus appendiculatus Neum Rhipicephalus e. evertsi Nm. ... Rhipicephalus s. sanguineus (Lat.) ...	22 1 4 1	8 1 1 1	
8.1.55	Equus burchelli ...	Near Lake Ngami ...	Hyalomma transiens Schulze ... Rhipicephalus e. evertsi Nm. ... Hyalomma r. rufipes Koch ... Rhipicephalus s. simus Koch ... Rhipicephalus neavei Warb. ... Rhipicephalus appendiculatus Nm ...	7 24 10 1 1 1	10 1 1 1	
11.1.55	Struthio camelus ...	Near Lake Ngami ...	Hyalomma transiens Schulze ...	1		
9.1.55	Syncerus caffer ...	Near Lake Ngami ...	Hyalomma transiens Schulze ... Rhipicephalus appendiculatus Neum	1 1	1	

ANNEXURE III

LIST OF SPECIMENS COLLECTED IN BECHUANALAND

Host	Locality	No. of Specimens	Ticks	Mites (Endoparasitic)	Mites (Ectoparasitic)	Lice	Fleas	Diptera	Helminths
MAMMALS									
CHIROPTERA									
Epomophorus crypturus ...	Maun ...	1	—	—	—	—	—	—	—
Tadarida pumila ...	Maun ...	5	—	—	+	—	—	—	—
PRIMATES									
Galago Senegalensis ...	L. Ngami ...	3	—	—	+	—	—	—	—
CARNIVORA									
Myonax cauii ...	Maun ...	1	—	—	—	—	—	—	—
Suricata Suricatta ...	Ghanzi ...	1	—	—	—	—	—	—	—
” ” ...	L. Ngami ...	1	+	—	—	—	+	—	—
Thos Mesomelas ...	L. Ngami ...	1	+	—	—	—	—	—	—
TUBULIDENTATA									
*Orycteropus afer ...	Maun ...	1	+	—	—	+	—	—	—
RODENTIA									
Gebosciurus inauris ...	Ghanzi ...	2	—	—	+	+	+	—	—
Paraxerus cepapi ...	Maun ...	5	—	—	—	+	—	—	+
” ” ...	Mosetsi ...	1	+	—	—	—	—	—	—
Rhabdomys pumilio ...	Tsane ...	1	—	—	+	+	—	—	+
ARTIODACTYLA									
Ancelaphus caama ...	Sekhuma-Kanye	1	—	—	—	—	—	+	—
” ” ...	Tsane ...	1	+	—	—	—	—	—	—
Antidorcas marsupalis ...	Ghanzi ...	1	—	—	—	—	—	—	—
” ” ...	Tsane ...	1	+	—	—	—	—	—	—
Connochaetes taurinus ...	Tsane ...	1	—	—	—	—	—	—	—
Oryx Gazella ...	Sekhuma-Kanye	1	+	—	—	—	—	—	+
Phacochoerus aethiopicus ...	L. Ngami ...	1	—	—	—	—	+	—	+
Raphicerus campestris ...	Kanyu...	1	—	—	—	—	—	+	—
Syncerus caffer ...	L. Ngami ...	1	+	—	—	—	—	+	+
PERRISSODACTYLA									
Equus burchelli ...	L. Ngami ...	2	+	—	—	—	—	+	+

LIST OF SPECIMENS COLLECTED IN BECHUANALAND

Host	Locality	No. of Specimens	Ticks	Mites (Endoparasitic)	Feather Mites	Other Mites	Lice	Fleas	Diptera	Helminths
BIRDS										
STRUTHIONIFORMES										
Struthio camelus ...	L. Ngami ...	1	+	—	+	—	+	—	—	
PELECANIFORMES										
Phalacricorax africanus	Maun ...	1	—	—	+	—	+	—	—	
CICONIIFORMES										
Bubulcus ibis ...	Maun ...	1	—	—	—	—	—	—	+	
*Egretta garzetta ...	Maun ...	1	—	—	+	—	—	—	—	
Leptoptilos crumeniferus	Maun ...	1	—	—	—	—	+	—	—	
Plegadis falcinellus ...	L. Ngami ...	1	—	—	—	—	+	—	—	
*Sphenorhynchus abdimii	L. Ngami ...	1	—	—	—	—	+	—	—	+
ANSERIFORMES										
Alopochen aegyptiaca	L. Ngami ...	1	—	—	—	—	+	—	—	
Nettapus auritus ...	Maun ...	2	—	—	+	—	—	—	—	
Thalassornis leuconotus	Maun ...	2	—	—	+	—	—	—	—	
FALCONIFORMES										
*Aquila rapax ...	Maun ...	1	—	—	—	—	—	—	—	
Gyps coprotheres ...	L. Ngami ...	2	—	—	—	—	—	—	—	
*Milvus aegyptius ...	Ghanzi ...	1	—	—	—	—	+	—	—	
” ”	Mosetsi ...	1	—	—	—	—	+	—	—	
*Milvus migrans ...	Mosetsi ...	1	—	—	—	—	+	—	—	
Aquila ? wahlbergi ...	L. Ngami ...	1	—	—	—	—	+	—	—	
GALLIFORMES										
*Francolinus adspersus	Maun ...	1	—	—	+	—	—	—	—	
” ”	L. Ngami ...	1	—	—	—	—	—	—	—	+
Numida mitrata ...	Mosetsi ...	1	+	—	—	—	+	—	—	
Pternistis swainsoni ...	Maun ...	4	+	—	—	—	+	—	—	
GRUIFORMES										
Actophilornis africana	Maun ...	1	—	—	+	—	—	—	—	
Afrotis afra ...	Sekhuma-Kanye	1	—	—	—	—	—	—	—	
Ardeotis kori ...	Tsane ...	1	—	—	—	—	+	—	+	+
Burhinus capensis ...	Maun ...	1	—	—	—	—	—	—	—	+
*Crecopsis egregia ...	Maun ...	1	+	—	+	—	—	—	—	+
Lissotis melanogaster ...	Tsane ...	1	—	—	—	—	—	—	—	
CHARADRIIFORMES										
Hoplopterus armatus ...	Maun ...	1	—	+	+	—	+	—	—	
COLUMBIFORMES										
*Pterocles burchelli ...	Kanyu...	1	—	—	—	+	+	—	—	+
Streptopelia capicola ...	Mosetsi ...	1	—	—	—	—	—	—	—	—
Streptopelia semitorquata ...	Maun ...	2	—	—	—	—	+	—	—	
Turtur chalcospilos ...	Maun ...	1	—	—	—	—	—	—	—	—
CULCULIFORMES										
*Centropus senegalensis	Maun ...	2	+	—	+	—	+	—	—	—
Centropus senegalensis	Mosetsi ...	1	+	—	—	—	—	—	—	
Corythaixoides concolor	Mosetsi ...	2	—	—	—	—	+	—	—	
Cuculus canorus ...	Mosetsi ...	1	+	—	—	—	—	—	—	

LIST OF SPECIMENS COLLECTED IN BECHUANALAND

Host	Locality	No. of Specimens	Ticks	Mites (Endoparasitic)	Feather Mites	Other Mites	Lice	Fleas	Diptera	Helminths
BIRDS—(continued)										
CORACIIFORMES										
Coracias caudata ...	L. Ngami ...	1	—	—	—	—	—	—	—	—
*Clauvidium perlata ...	Maun ...	2	—	—	+	—	—	—	—	—
” ” ...	Mosetsi ...	1	—	—	+	—	—	—	—	—
Lophoceros erythrorhynchus	Mosetsi ...	1	+	—	—	—	—	—	—	—
Lophoceros erythrorhynchus	L. Ngami ...	1	+	—	—	—	—	—	—	—
Lophoceros nasutus ...	Maun ...	1	—	—	—	—	+	—	—	—
” ” ...	Tsane ...	1	—	—	—	—	—	—	—	—
Upupa africana ...	L. Ngami ...	1	—	—	—	—	—	—	—	—
PASSIFORMES										
Bradornis mariquensis	L. Ngami ...	1	—	—	+	—	—	—	—	—
Bubalornis albirostris ...	Mosetsi ...	1	—	—	+	—	+	—	—	—
Cisticola chiniana ...	L. Ngami ...	1	—	—	+	—	—	—	—	—
*Corvus Albus ...	Mosetsi ...	1	—	—	+	—	+	—	—	—
Dicrurus adsimilis ...	Maun ...	2	—	—	—	—	—	—	—	—
” ” ...	Mosetsi ...	1	—	—	—	—	—	—	—	—
Emberiza flaviventris ...	Makarikari ...	1	—	—	—	—	+	—	—	—
” ” ...	Tsane ...	1	—	—	+	—	—	—	—	—
Erythropygia leucophrys	Makarikari ...	1	—	—	—	—	+	—	—	—
*Erythropygia paena ...	Ghanzi ...	1	—	—	—	—	—	—	—	—
*Estrilda erythronotos ...	Maun ...	1	—	—	+	+	—	—	—	—
Eurocephalus anguitimens	Mosetsi ...	1	—	—	+	—	—	—	—	—
*Granatina granatina ...	L. Ngami ...	1	—	—	+	—	—	—	—	—
” ” ...	Makarikari ...	1	—	—	+	—	—	—	—	—
Lamprocolius chalybeus	Tsane ...	1	—	+	—	—	—	—	—	—
Lamprotornis mevesii...	Maun ...	2	—	—	—	—	+	—	—	—
*Laniarius neglectus ...	Maun ...	2	+	—	—	—	—	—	—	—
Mirafra africanoides ...	Sekhuma-Kanye	1	—	—	—	—	—	—	—	—
Plocepasser mehali ...	L. Ngami ...	2	—	—	—	—	—	—	—	+
Prinia flavicans ...	L. Ngami ...	1	—	—	+	—	—	—	—	—
Prinia flavicans ...	Sekhuma-Kanye	1	—	—	—	+	—	—	—	—
*Sporopipes squamifrons	L. Ngami ...	2	—	—	+	+	+	—	—	—
*Turdoides bicolor ...	Makarikari ...	1	—	+	—	—	—	—	—	+
” ” ...	Mosetsi ...	1	—	—	—	—	—	—	—	—
Turdoides jardineii ...	Maun ...	1	—	+	—	—	—	—	—	—
*Urolestes melanoleucus	Maun ...	1	—	+	—	—	—	—	—	—
Xanthophilus xanthops	Maun ...	1	—	—	—	—	+	—	—	—

LIST OF SPECIMENS COLLECTED IN BECHUANALAND

Host	Locality	No. of Specimens	Ticks	Mites (Endoparasitic)	Mites (Ectoparasitic)	Helminths
REPTILES						
Crocodilus niloticus	Maun	1	—	—	—	—
Eremias lugubris	Sekhuma-Kanye	1	—	—	—	—
Boaedon lineatus... ..	L. Ngami	1	—	—	—	—
Dispholidus typus	Makari-kari	1	—	—	—	—
Chamaeleo dilepsis	Makari-kari	1	—	—	+	+
” ”	L. Ngami	1	—	—	—	—
Agama aculeata	L. Ngami	1	—	—	—	+
Colopus wahlbergii	Ghanzi	1	—	—	—	—
Mabuya striata	Ghanzi	1	—	—	—	—
Eremias namaquensis	Tsane	1	—	—	+	—
Pachydaetylus capensis	Tsane	1	—	—	—	—
Habuya occidentalis	Tsane	1	—	—	+	—
Agama aculeata	Tsane	1	—	—	+	+
Mabuya striata	Tsane	4	—	—	+	+
” ”	Tsane	1	—	—	+	—
AMPHIBIANS						
Bufo regularis	Makari-kari	1	—	—	—	—
Pyxicephalus adspersus	Kanyu... ..	1	—	—	—	—

Ninety species (143 specimens), 27 species not previously checked.

* Species not previously checked for parasites.

ANNEXURE IV

PARASITES FOUND ON DOMESTIC ANIMALS

Host	Locality	Parasite
Cattle	Sekhwana	Hippobosca rufipes Olf—(louse-fly)
”	”	Rhipicephalus e. evertsi Neum—(ticks)
”	”	Hyalomma rufipes glabrum Delpy—(ticks)
”	”	Hyalomma transiens Schulze—(ticks)
”	”	Boophilus decoloratus Koch—(ticks)
”	”	Amblyomma hebraeum Koch—(ticks)
Dog	Sekhwana	Hippobosca longipennis F.—(louse-fly)
”	”	No mange
Goat	Sekhwana	Rhipicephalus e. evertsi Neum—(ticks)
Horse	Sekhwana	Hippobosca rufipes Olf.—(louse-fly)
”	”	Hyalomma rufipes glabrum Delpy—(ticks)
”	”	No mange
Sheep	Sekhwana	Rhipicephalus e. evertsi Neum—(ticks)
”	”	Psoroptes ovis (Hering)—mange (mites)



SKETCH MAP
OF THE
BECHUANALAND PROTTE
S. AFRICA.

Scale. 60 Miles to One Inch

- REFERENCE
- Railways..... HALT or SIDING
 - " proposed route.....
 - Motor roads or tracks.....
 - Surveyed tracks.....
 - Unsurveyed tracks.....
 - Boundaries, International.....
 - " Intercolonial.....
 - " District or Reserve.....
 - Places of 1st importance..... BULAWAYO
 - " 2nd "..... Maun
 - " 3rd "..... Toteng
 - " 4th & 5th "..... Matapa
 - Watercourses.....
 - " Unsurveyed.....
 - Marshes and swamps.....
 - Area perennially flooded.....
 - " flooded in normal flood seasons.....
 - Pen or Vic.....



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